

CLAIMS

What is claimed is:

1. A filtration system comprising:
an elongated outer casing defining an outer lumen;
a plurality of elongated inner casings disposed within the outer lumen, each of the
inner casings having an inner lumen in which is disposed a filter; and
the outer casing, inner casings, and filters disposed relative to one another to define a
feed fluid flow path in which a feed fluid exiting from an upstream filter into a
downstream filter is diluted by additional feed fluid.
2. The filtration system of claim 1 wherein the additional feed fluid passes to the
downstream filter by flowing from the outer lumen through an opening in one of the
inner casings.
3. The filtration system of claim 2 wherein the opening is dimensioned to produce a
maximum operational pressure drop of about 20%.
4. The filtration system of claim 1 wherein each of the inner casings contains a plurality
of the filters.
5. The filtration system of claim 1 wherein the plurality of filters in at least one of the
inner casings is serially disposed to provide a substantially continuous core space.
6. The filtration system of claim 6 further comprising a manifold fluidly coupling the
inner lumen of each of the inner casings, and another manifold fluidly coupling the
core space of each of the inner casings.
7. The filtration system of claim 6 having opposite ends, and both of the manifolds
extending from the same one of the opposite ends.
8. The filtration system of claim 1 wherein at least one of the inner casings contains a
plurality of the filters serially disposed to provide a substantially continuous core
space, and wherein a permeate flow path extends through the substantially continuous
core space.
9. The filtration system of claim 8 wherein the serial disposition of the filters in at least

one of the inner casings defines a substantially continuous annular space between an inner wall of each of the inner casings and the filters disposed within the inner casings.

10. The filtration system of claim 1 wherein at least one of the filters is spiral wound.
11. The filtration system of claim 1 wherein at least one of the filters comprises hollow fiber membranes.
12. The filtration system of claim 1 further comprising an energy recovery device that derives energy from a waste fluid in the waste fluid flowpath.
13. The filtration system of any one of claim 1 wherein the outer casing is disposed substantially above ground.
14. The filtration system of claim 1 having a coupling/filter ratio $\leq 1:2$.
15. The filtration system of claim 1 having a coupling/filter ratio $\leq 1:3$.
16. The filtration system of claim 1 having a coupling/filter ratio $\leq 1:4$.